An Integrated and Synergistic Systems Analysis Approach

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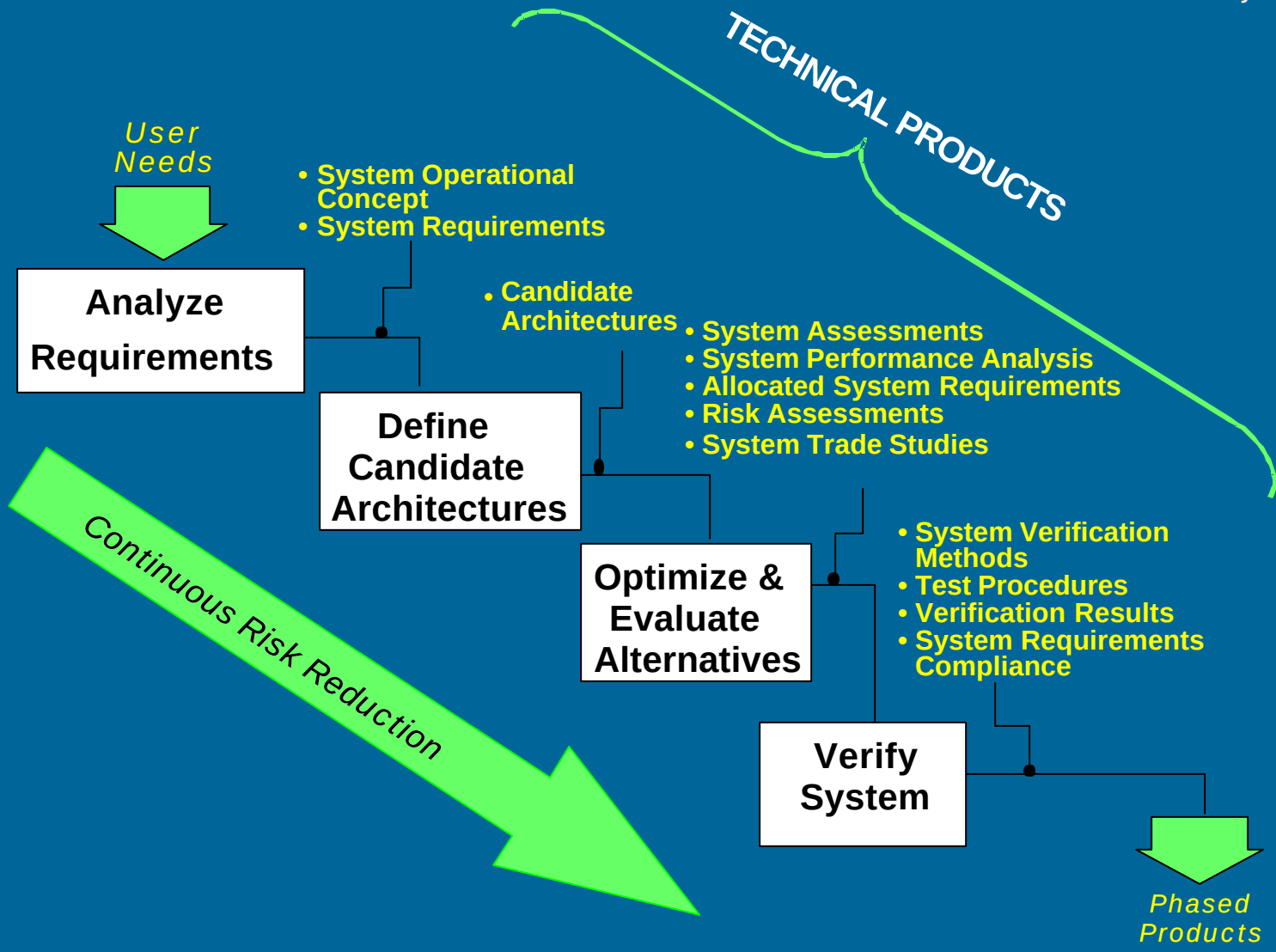
Why introduce iteration into Systems Engineering?

- Enables refinement of analysis models as system design evolves
- Promotes analysis model re-use
- Permits concurrency and feeding of parameters from one model to another
- Ensures fully validated system that meets or exceeds customer needs
- Adheres to systems engineering process

System Engineering Process



Iterative System Engineering Process

Transition to a structured iterative process by introducing integrated tools and establishing integrated engineering processes

Analyze Requirements

- Object Oriented Requirements Management Tool
- High Level Analyses

Define Candidate Architectures

- Functional Diagrams
- OOA
- Simulation & Modeling
- Visual Modeling
- Use Case Analysis

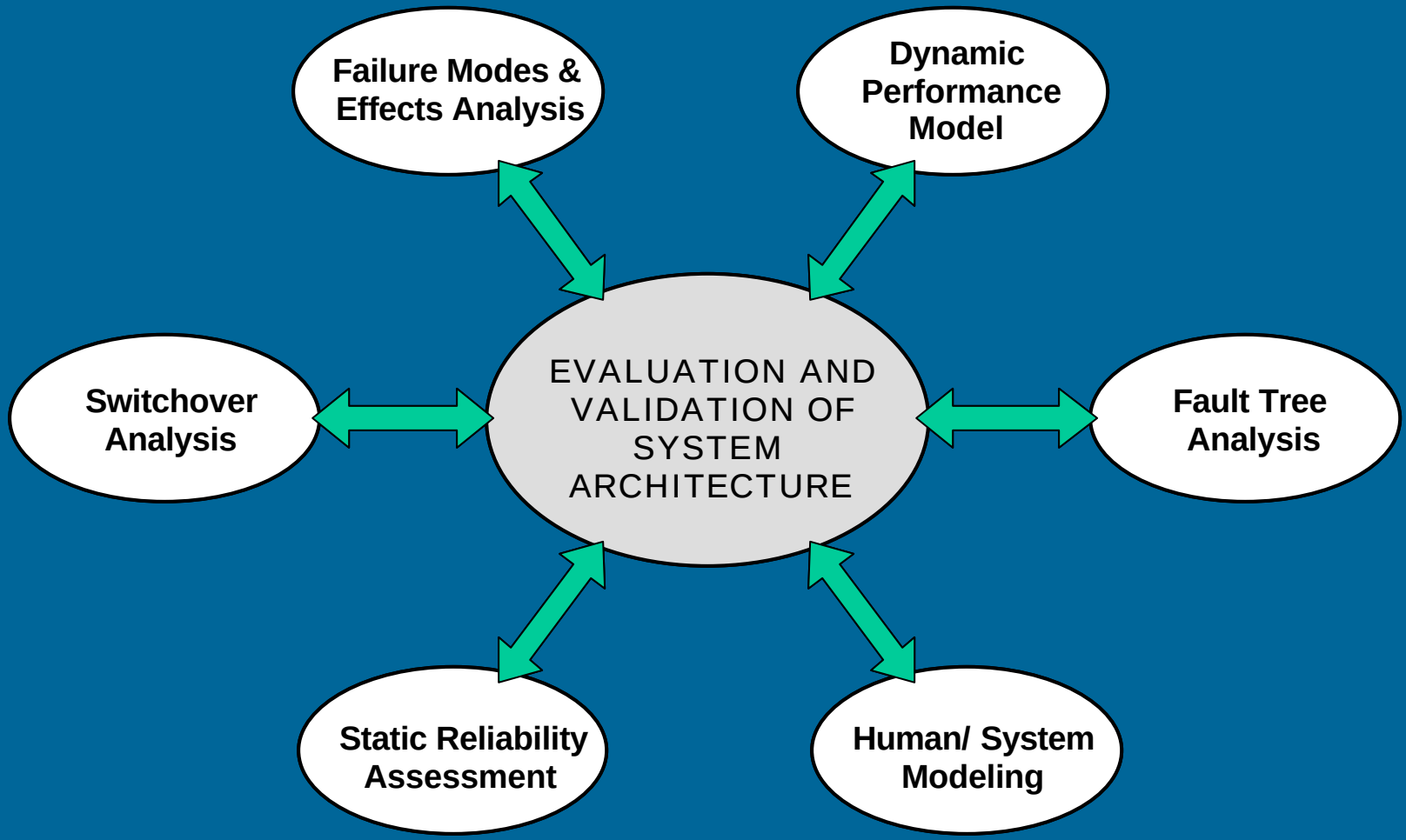
Optimize and Evaluate Alternatives

- Analysis Refinement

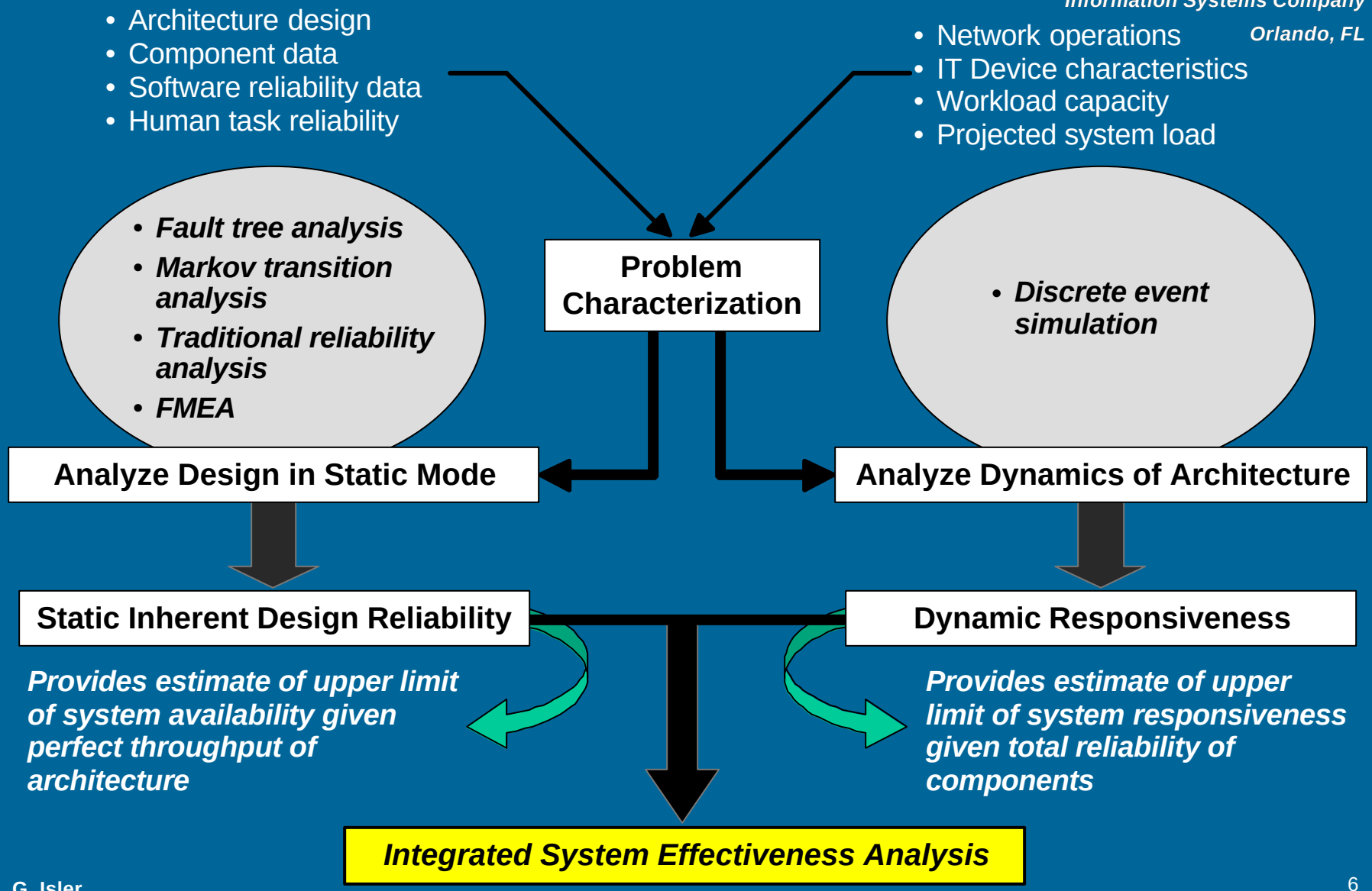
Verify System

- Continued Analysis Refinement

System Evaluation and Validation



Integrated System Assessment



Integration and Test

- Benefits of synergistic engineering become apparent during integration and test
- Model results are instrumental in development of interface documents and test cases
- Traceability and design integrity are promoted by maintenance of relationships throughout the life cycle
- Simulations can augment testing by emulating hardware responses to software commands
- Virtual integration activities can be performed in parallel with actual hardware integration
- Visualization of architecture enables validation of software

Summary

- Establishment of integrated and synergistic environment early in life cycle essential
- Manpower planning facilitated through personnel and domain knowledge migration
- Object oriented systems engineering processes promote total system design
- Transition to CMMI assessment facilitated with integrated engineering processes
- Enhancement to systems engineering tool suites critical for ensuring supportable and interoperable system designs